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The development of a plastic scintillator for radiotherapy dosimetry

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THE DEVELOPMENT OF A PLASTIC SCINTILLATOR FOR RADIOTHERAPY DOSIMETRY

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CERTIFICATION

I, Johnny Estuardo Morales, declare that this thesis, submitted in fulfilment of the requirements for the award of Master of Science, in the Department of Engineering Physics, University of Wollongong, NSW, Australia is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualifications at any other academic institution.

Johnny E. Morales

19th March 2008

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ABSTRACT

A plastic scintillator detector was developed and tested in a 6MV photon beam. The detector comprised a BCF60 plastic scintillator, Polymetyl-Methacrylate Resin optical fibre and photodiode SFH250. The detector was used to measure an inplane profile for the photon beam at a depth of 1.5 cm for a field size of 10x10cm^2 at 100 cm SSD. The photon beam was delivered by a Siemens linear accelerator. A comparison was made with the results obtained by cylindrical chambers CC04 and CC13, commercial diode PFD and a stereotactic diode SFD, all from the manufacturer IBA-Wellhöfer. An analysis was performed using the Gamma Evaluation method and the agreement was acceptable for a criterion of Distance To Agreement = 2 mm and Dose Difference = 2%.

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